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Middle School Transition: The Role of Timing and School Characteristics

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Middle School Transition: The Role of Timing and School Characteristics

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Abstract

Middle School Transition: The Role of Timing and School Characteristics

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Achievement and school involvement of children in middle schools in 5th and 6th grades are compared to those of same-grade peers in elementary schools. Both classroom quality and school structure (size and composition) are tested as mediators in a national longitudinal sample of about 900 youth. The results indicate: a) youth in middle schools achieve at least as well as their same-grade peers in elementary schools, but those in middle schools have lower school attachment; b) middle and elementary schools have equivalent classroom quality, but differ in size and student composition; c) the lower school involvement of 6th grade middle school students is attributable to school size; d) the results are similar for boys and girls.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Transition out of elementary school is often identified as the point when students' grades, interest in school, and sense of competence start declining (Cook, MacCoun, Muschkin, & Vidgor, 2008; Eccles, 2004; Eccles et al., 1993; Simmons & Blyth, 1987). The causes proposed to account for this decline are multiple, ranging from disruption of social connections (Oh et al., 2008), dramatic change in school structure in a vulnerable developmental period (Barber & Olsen, 2004), to instructional processes that are ill-fit for the students' developmental needs (Eccles et al., 1993). Eccles (2004) summarized this scholarship in an ecological framework, organizing the different factors as different levels of analysis.

The purposes of the present study were to investigate the relations of timing of transition into middle school to students' achievement, school engagement, and self-perceived competence, testing the processes proposed in Eccles' (2004) ecological framework including instructional quality in the classroom, teacher perceptions, school composition and school size. Secondarily, gender differences in responses to transition and the processes involved were investigated. The analyses were performed on a national sample of about 1,000 children in who were followed over the years from third to seventh grades. Because of their residence in different geographic locations, different groups of students moved into middle school at different grade levels, permitting cross-sectional comparisons of children in a given grade level who were attending elementary or middle school.

The conceptual framing of the effects of the middle-school transition substantially revolves around two major themes. First, middle schools are of lower quality than elementary schools as indexed by ineffective teachers and classrooms (e.g., Midgley,

Feldlaufer, & Eccles, 1989a); diverse and fragmented student-body; and a large school size, creating an impersonal atmosphere and increased regimentation (e.g., Weiss & Kipnes, 2006). This organization of middle schools, Eccles and her colleagues (1993) argued, is out of step with their students' developmental needs for a gradual rise in autonomy, cognitive stimulation and participation in decision-making, and relates to middle-school students' lower achievement, school engagement, and lower sense of competence.

A second perspective focused on the school-level transition as a destabilizing factor in a developmentally sensitive period when youth are entering adolescence and puberty. Adolescence and puberty are not universally stressful, but this developmental period is unpredictable (Larson & Ham, 1993) and unstable (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Despite the onset of hormonal changes associated with puberty, the key to adolescents' unrest seems to be the changing nature of their social relationships (Arnett, 1999). Adolescents are re-defining their relations with their parents, other adults, and peers, tasks that often result in conflict (Arnett, 1999), role strain (de Bruyn, 2005) and general stress and emotional instability (Larson & Ham, 1993). Given the complexity of this developmental period, the introduction of a substantial change in school organization increases the risks of a conflict, or turmoil in the students' lives (Simmons & Blyth, 1987).

STUDENT FUNCTIONING IN MIDDLE SCHOOLS

Both theories lead to the hypothesis that students' achievement, school involvement and sense of competence decline with the middle school transition, and that this decline is greater than the decline that occurs as a consequence of developmental changes in early adolescence. The theories differ in that Eccles' (1993) predicts that

instructional quality and an impersonal environment are the primary processes responsible, whereas Simmons and Blyth's (1987) position predicts that the transition itself is the important determinant of students' responses.

Published data consistently highlight how students' achievement, school engagement and perceived competence in middle schools compare unfavorably to students in K-8 elementary schools. A recent analysis of administrative data on all schools in the U.S. found that school districts that replace K-8 schools with middle schools experience a 1% to 3% drop in on-time high-school graduation (Bedard & Do, 2005). School districts already using middle schools reported fewer students graduating on time, more students being disciplined, and more students performing poorly on standardized tests compared to school districts using K-8 schools (Alspaugh, 1998; Cook et al., 2008). In the present study, I will focus on three areas of youth development: achievement, engagement in school, and perceived school competence.

Achievement

Youth in middle schools receive lower grades than they used to receive in elementary schools (Eccles et al., 1993) and than their peers receive in elementary schools (Cook et al., 2008; Simmons & Blyth, 1987). This difference in achievement is not unique to a particular mode of assessment. Students in middle school compare unfavorably to their same-grade peers in elementary schools on grades (e.g., Gutman & Midgley, 2000), standardized tests (Alspaugh, 1998; Cook et al., 2008) failure of key subjects (Weiss & Kipnes, 2006), and on-time graduation (Bedard & Do, 2004). Eccles and Midgley (1989), however, found that as students moved to junior high schools, their grades declined more than did their tested achievement, implying that distinguishing different indicators of achievement may be important. On the one hand, bright students'

grades may decline with lower motivation (a drop that may not be reflected on standardized tests); on the other hand, middle-school teachers may grade harsher than their elementary-school counterparts.

Alspaugh and Harting (1995) followed achievement and school engagement of students in grades 4, 5, 6, 7, 8, and 9; portions of this sample moved to middle or high school in each of these grades. Their results indicate that youth in early adolescence are already struggling in some aspects of their schools, and their grades and school engagement are declining even in the absence of school-level transition. If students changed school level in any of these grades, the decline in the two measured outcomes was even steeper.

The contribution of Alspaugh and Harting's (1995) study lies in the comparison of multiple groups of students. Like the studies discussed above, they tracked students' changes in achievement and engagement between grades, but also compared the groups of students within grade, between students who changed school level and those that did not. The majority of the reviewed studies followed single groups of students as they transitioned to middle school. Alspaugh and Harting and other researchers compared students in middle school to a comparison group of elementary school students within the same grade. These between-group, within-grade analyses provided an important level of detail missing from studies using only a single group of students. I will contrast the results of these two approaches throughout the literature review, although our understanding from between-group analyses is often weak.

Engagement in School

Across grades, students moving into middle school report declining interest, involvement, and extracurricular participation in school. As outlined above, this trend is

present even without a school-level transition, but is more prominent when students move from elementary to middle school (Alspaugh & Harting, 1995). Studies following only a single group of transitioning students have found unanimous support for a decline in engagement on varied indicators, such as teacher trust and liking (Midgley, Feldlaufer, & Eccles, 1989a), school liking and school preparation effort (Skinner, Furrer, Marchand, & Kindermann, 2008), and participation in extracurricular activities (Siedman et al, 1994), but the method does not allow them to separate the developmental trend from the effect of a school-level transition.

Analyses comparing school engagement of middle school students and their same-grade peers in elementary school are not common, and their results are not unequivocal. Some studies do find middle school students score lower on school engagement (Alspaugh & Harting, 1995; Simmons & Blyth, 1987) and school effort (Rudolph at al., 2001). In contrast, Weiss and Kipnes (2004) found no difference in school liking and absenteeism. These authors, however, used a unique methodology which compared students at the moment of entering high schools from either elementary (K-8) or middle (6-8) schools; the comparison at eighth grade may have allowed for attenuation of any differences present immediately post-transition in sixth grade.

Self-Perceived School Competence

As students move to middle school, their confidence in their ability to learn and master subjects, such as math and English, declines (e.g., Anderman & Midgely, 1997). This finding has been replicated with a number of different self-report scales [e.g., self-efficacy (Siedman et al., 1994), self-concept of ability (Wigfield & Eccles, 1991]. Declines in self-perceived competence are present even when prior achievement is accounted for (Siedman et al., 1994). An extensive literature review found no studies

comparing perceived competence of students in middle school with the competence of their same-grade peers in elementary schools. This is an important omission because, as with grades and engagement (Alspaugh & Harting, 1995), adolescents' perceived competence declines with age – regardless of school-level changes (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002).

In summary, the available literature consistently shows declines in achievement, school engagement, and self-perceived competence when students enter middle school. Although this pattern is widely accepted, our confidence in understanding the "transition effect" is weakened by the field's reliance on single-group designs, in which one sample of students is followed through a transition, which does not allow separation of developmental changes from changes associated with school-level transition. Studies comparing students between-groups and within-grade do exist, and they align with the prominent single-group studies in showing lower achievement in middle schools. The results are less clear for school involvement, however, and this design has not been used to assess differences in students' sense of competence.

Samples of limited geographic scope constitute still another issue in the current literature. In the present study, children are part of a national sample representing a wide range of school districts and practices. Children were followed longitudinally from third through sixth grades, allowing comparison of individual changes over time and cross-sectional comparisons of children who entered middle school in fifth grade or sixth grade with those in the same grade who were still in elementary school. The first aim of this study is to examine the differences in achievement, engagement in school, and perceived school competence between fifth- and sixth-grade youth in middle schools and their same-grade peers in elementary schools.

CHARACTERISTICS OF MIDDLE SCHOOLS

Students in the middle grades are in a process of renegotiating their relationships with important adults, peers, and establishing their own identities (Arnett, 1999). In the context of these negotiations, students benefit if their classrooms are led by teachers who trust and care for them and provide cognitively-stimulating instruction (Eccles et al. 1993). Even though many adolescents partially disengage from their schools in early adolescence (Alspaugh & Harting, 1995; Gutman & Midgley, 2000), classrooms that focus on achieving goals, rather than increasing performance, mitigate this trend (Midgley, Anderman, & Hicks, 1995). Schools that contain racially and economically homogeneous student bodies and are smaller overall not only promote students' sense of belonging (Simmons & Blyth, 1987), but also usually have school policies allowing students more freedom based around trust (Eccles et al., 1993).

Classroom Process

Teachers' sense of teaching efficacy, relationship with their students and their effective management of their classrooms shape students' experiences and learning. Teachers who believe they can help all students learn the material (Friedel et al., 2010) and who are fair and like their students (Midgley et al., 1988; Skinner et al., 2008), and are perceived as being fair and caring by their students (Midgley et al., 1988) can nourish their students' academic performance (Gutman & Midgley, 2000), engagement in schools (Skinner et al., 2006), and sense of competence in subjects such as math and English (Friedel et al., 2010; Midgley et al., 1989). Youth in middle schools, however, are often taught by teachers who feel less efficacious, caring and trusting than the teachers teaching their elementary school peers (Barber & Olsen, 2004; Eccles et al., 1993).

Students moving into middle schools join classrooms that are less stimulating and organized than their classrooms the year prior (for a summary, see Eccles et al., 1993). In

one set of studies tracking a single group of students as they moved to junior high school, their junior-high teachers (compared to elementary school teachers the year prior) spent less time on individualized instruction and cognitively-stimulating activities and more time lecturing (Midgley et al., 1988). Teachers in junior high schools also spent less time teaching and more time managing their classrooms, and students were less engaged and disciplined more frequently (e.g. Midgley et al., 1988). A more recent observational study (McCoy, 2005) did not compare middle schools with elementary schools, but replicated the relation between ineffective teachers and students' low interest and competence in math in eighth grade. No studies include comparisons of middle-school and same-grade elementary school classrooms through observational data.

School Demographics and Size

Structural differences between middle schools and elementary schools might also account for differences in students' achievement and motivation. Middle schools, compared to elementary schools, tend to be more ethnically and economically diverse and larger, making them less personal and possibly making it more difficult for students to develop new peer relationships. Both school size and diversity are related to school engagement.

Student body "diversity," defined as the percentage of non-white students and the percentage of students using free and reduced lunch programs, is associated with relatively low achievement and engagement in school (e.g. Simmons & Blyth, 1987), even in a sample of predominantly low-income, African American schools (Weiss & Kipnes, 2006). Benner and Graham (2009) used a more precise racial diversity index, which calculated the relative size of students' own ethnic in-group relative to the number and size of other ethnic groups in the school. The diversity index increased (students'

racial or ethnic in-group shrunk) as students moved from middle schools to high schools, and their grades suffered.

The mechanisms behind the effects of school demographics have not been fully documented, but a few hypotheses have been posited. Simmons and Blyth (1987) highlighted two possible pathways joining school demographics and youth outcomes: sense of belonging and staff trust. First, students coming from racially and economically uniform elementary schools may have trouble interacting with students from different backgrounds, resulting in increased alienation, dislike of school, and potential conflict. This explanation is consistent with Benner and Graham's (2009) more detailed findings. Second, Simmons and Blyth explored school demographics as a proxy for schools that may impose stricter rules, with cooler relations between staff and students. This approach to school management may, in turn, create a climate that counters the developmental needs of early adolescents (Eccles et al., 1993).

Similarly, in large schools, students felt alienated, lacked the desired relationships with teachers, and consequently felt unmotivated to excel (Simmons & Blyth, 1987). As a result, grades suffered. Weiss and Kipnes (2006) found parallel effects of school size on grades and engagement, and Benner and Graham (2009) documented the impact of increased school size during a transition to high school on grades and school liking. These relations of school size and student functioning were not replicated, however, in a study where an extensive set of school characteristics (e.g., urbanicity, student bussing) were used as covariates (Anderman, 2002). As with school demographic diversity, the mechanism of the effect school size is up for debate.

The two school indicators – ethnic/SES mix and size – are correlated and both may be related to strict school policies precluding individualized consideration and attention (Simmons & Blyth, 1987). Additionally, seminal work by Baker and Gump

(1964) indicated that large high schools limited students' participation options, considering competition for placement in sport teams, student government and other student institutions is likely more fierce in larger schools.

The second aim of the present study is to examine the effects of school characteristics--observed classroom process, teacher-reported efficacy, school demographics and school size – on student functioning. I will examine variations in school characteristics as explanations for the differences between the functioning of students in middle schools and elementary schools.

THE ROLE OF GENDER IN TRANSITION OUT OF ELEMENTARY SCHOOL

There is some evidence that boys and girls differ in some aspects of their reaction to changing school levels. On average, girls seem to navigate the transition without major problems and maintain their engagement (e.g., Skinner et al., 2008; Akos & Galassi, 2004), whereas boys' engagement declines. Some researchers have found similar gender pattern for grades (girls' grades remain stable, boys' decline; Chung, Elias, & Schneider, 1998; Simmons & Blyth, 1987), but others found no difference (Siedman et al., 1994). Still others have found a persistent mean gender difference in grades, with girls earning higher grades, but no difference in trajectories across middle school transition (Wampler, Munsch, & Adams, 2002). The two genders also do not seem to differ on their post-transition self-concept of ability (Wigfield, Eccles, Mac Iver, Reuman & Midgley, 1991), and when they do, this difference is not related to navigating the school-level transition (Jacobs et al., 2002).

The explanations of gender differences center on the differences in pubertal timing, differences in the developmental timing of school-level transition, and finally, different responses to the presence of older peers (Eccles et al., 1993; Simmons & Blyth,

1987). However, the field is once again over-reliant on single-group designs that confound developmental changes with changes due to school discontinuity, with only one study (Simmons & Blyth, 1987) comparing youth in middle school to their peers in elementary schools. The third aim of the present study is to examine whether relations between school-level, school characteristics, and youth outcomes differ by gender.

OVERVIEW OF THE PRESENT STUDY

In the present study, I compared fifth- and sixth- grade youth in middle school with their same-grade peers in elementary school. Drawing on a national sample of about 1,000 youth who had been studied since infancy, I examined differences in achievement, school involvement, and self-perceived ability for students in different types of schools. The longitudinal data allowed examination of individual changes in achievement in the different school types. School characteristics — both structure and classroom process — were examined as possible mediators of differences associated with different types of schools, and gender was included as a potential moderator.

I posed the following research questions:

1. Do children in middle schools exhibit different levels of achievement, school engagement, and perceived competence than their same- grade peers in elementary school?
2. Do children in middle schools attend classrooms and schools with different characteristics than do their peers in elementary schools?
3. Do variations in classroom and school characteristics predict student achievement, engagement or perceived competence? Do these variations explain any effects of school-level on youth achievement and school functioning?

4. Do the relations of school levels or characteristics to youth achievement and school functioning differ by student gender?

The design of this study combines unique aspects of the sample to address key shortcomings of the prior research. First, the study stands apart from much of the field in comparing multiple groups of students progressing through different middle-grades arrangements. As highlighted throughout, much of the field relies on tracking a single group of students and comparing their pre- and post- transition context and functioning (e.g., Eccles et al, 1993). However, this approach confounds the developmental trajectories with effects of changing school-levels (see Alspaugh & Harting, 1995). I eschew this practice and compare three groups of students – two are in middle school by sixth grade, and one is still in elementary school.

Second, the data used in this study expand the breadth of the populations sampled in prior research. Much of the research relied on data from one or few school districts (e.g., Eccles et al., 1993; Simmons & Blyth, 1987; Weiss & Kipnes, 2006), with detailed information on schools and students, but vulnerable to school- and district- level confounds. A few studies used broader datasets, but those usually relied on administrative data for a state (e.g., Cook et al., 2008) or the whole nation (e.g., Bedard & Do, 2004). These analyses eliminate the narrowness of district-specific data, but usually lack the detailed measures of schools and students.

The present study utilizes a longitudinal dataset collected from ten geographic areas around the U.S., and spanned over 600 elementary schools in a number of school districts. Moreover, the data include detailed measures on both the students and the schools, creating a combination of breadth and depth of data not seen in prior research.

Finally, the longitudinal nature of the data (following participants since infancy) allowed for models that included a number of strong covariates, including third-grade

achievement. This level of statistical control provided a clearer look at the effects of the studied variables, above and beyond confounding demographic variations.

Chapter 2: Method

SAMPLE

The participants in the present study recruited for the NICHD Study of Early Child Care and Youth Development (SECCYD), a large-scale national longitudinal investigation conducted by the Early Child Care Research Network (E.C.C.R.N.). Healthy, full-term newborns were randomly selected from 24 hospitals in ten U.S. sites (Little Rock, AR; Orange County, CA; Lawrence and Topeka, KS; Wellesley, MA; Pittsburgh, PA; Philadelphia, PA; Charlottesville, VA; Seattle, WA; Hickory, NC; and Madison, WI). Children were selected randomly with several exclusion criteria, such as: 1) being pre-term, 2) having a significant birth defect, 3) mother being under 18, and 4) their family was not planning to remain in catchment area for at least 3 years (NICHD E.C.C.R.N., 1994).

The sampling procedure was designed to draw a representative sample from births in hospitals in the ten sites, with the requirement that single mothers, ethnic minorities, and mothers with less than a high school education were included. A distribution of plans for working or going to school within the first year of the child's birth was intended, but no stratification was required to achieve this distribution (Allhusen et al., 2001; NICHD E.C.C.R.N., 1994). Originally, 1,364 children were enrolled when they were one month old, and 1077 still participated in the study around the time of middle school transition.

Two analytical samples, one for the fifth grade analysis and one for the sixth grade analysis, were selected for the present study based on the presence of key data. I included only those children who had not been held back and whose grade of school-level transition could be determined. This determination relied primarily on the Common Core data from the National Center for Education Statistics (NCES). This dataset includes

information on school level on all public schools. When NCES data were not available, principal and teacher surveys were used. Both these informants were asked about the grades taught in their schools, which allowed for coding analogous to NCES data.

In total, out of the total of 1077 participants active in the SECCYD data, 33 participants were eliminated because their school could not be determined (i.e. they lacked NCES identifiers and principal and teacher data for 6th and 7th grade). For an additional 44 participants, I could not determine their grade or school level (elementary school or middle school). Another 13 participants had been retained a year prior to 5th grade, and the regular data collection was out of sync with the remaining participants. Finally, one participant was retained in sixth grade, one participant was in middle school in fifth grade, but in elementary in sixth grade, and another was in a school marked as "other" (a designation reserved for specialized schools, such as schools for the blind). These participants were removed from all the analyses.

The final study samples for fifth and sixth grade analyses consisted of 961 and 869 youth, respectively. The reduced sample size in sixth grade is a result of missing school IDs. For demographic information of the samples, see Table 1.

Table 1. Demographic characteristics of the two study samples.

	5th grade sample (*N* = 961)			6th grade sample (*N* = 869)		
	Percent	Mean	SD	Percent	Mean	SD
Female	50.8 %			50.6%		
White	81.9 %			81.4%		
Black	11.3 %			11.9%		
Latino	5.9 %			6.1%		
Mother education (years)		14.4	2.55		14.25	2.42
Income-to-needs (log)		1.09	0.73		1.04	0.73
Tested achievement in 3rd grade (z)		-0.04	0.85		-0.05	0.86

PROCEDURE

The NICHD SECCYD data are unique in their breadth and depth. The child participants were enrolled at the age of one month, with periodic assessments throughout the preschool and elementary school age periods. At the time of middle school transition, the participants and their families were contacted annually. Children were interviewed annually, soliciting such information as their liking of school or sense of academic competence. In third and fifth grade, participants were evaluated through a standardized achievement test, and in sixth grade, children were asked to respond to paper and pencil surveys.

Annual surveys were also mailed to the children's teachers and principals. Teachers were asked about their sense of efficacy and control of the classroom, their relationship with the participant students, the participants' school progress, and their school's composition. Principals were asked about the composition and organization of their school. In fifth grade, research assistants visited each child's school and observed several class periods, providing molar codes of the classroom climate and instructional quality of the classrooms.

TRANSITION GROUP MEMBERSHIP

A key independent variable of this study is the participants' timing of middle school transition. Approximately 10% of the sample began middle school in fifth grade and were assigned to the early transition group (N =100). About 48% of the sample began middle school in sixth grade, and were assigned to the standard transition group (N = 470). The remaining 42% of participants remained in elementary school through sixth grade and were assigned to the late transition group (N = 414; see Figure 1). The determination of transition group membership was conducted alongside sample selection utilizing a number or data sources (see Sample section above).

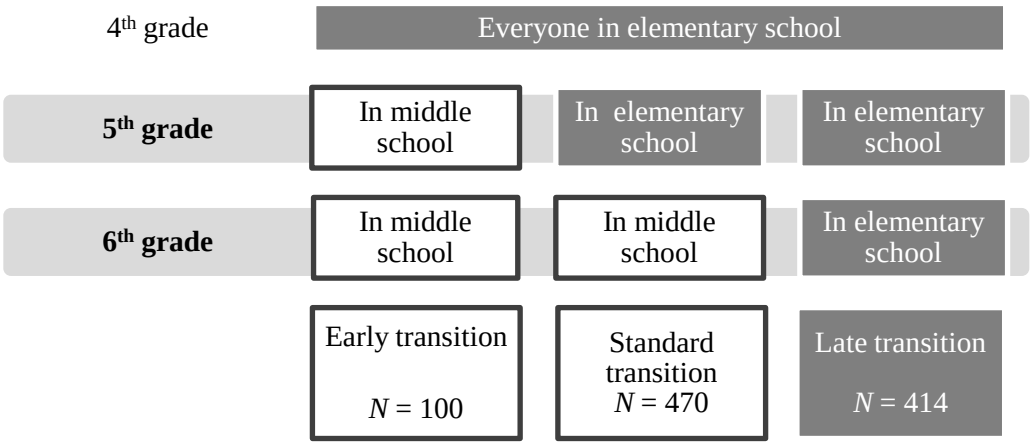

Figure 1. Timing of middle school transition in the sample.

MEASURES

School Characteristics

The bivariate correlations, means and standard deviations of all analysis variables can be found in Table A1 of the appendix. Two indicators of classroom process and two indicators of school composition were used. In fifth grade, youths' classrooms were observed, and in fifth and sixth grade, youths' teachers reported on their efficacy and relationship with their student participants. In both fifth and sixth grade, the schools' proportions of minority and poor students and the school sizes were calculated.

Observed classroom quality (5th grade). Participants' fifth grade classrooms were observed by trained observers using the classroom observation system (COS; see NICHD E.C.C.R.N., 2002 for details; *N* = 914). Observers recorded a number of ratings about the teacher and his or her management of the classroom. These ratings were combined into two composite scores, which were used in the present study. *Classroom*

socio-emotional quality combined six ratings of the teacher's warmth and effective management of the classroom [classroom over-control (reverse-coded), chaos (reverse-coded), teacher detached (reverse-coded), positive classroom climate, negative classroom climate (reverse-coded), and teacher sensitivity; α = .87]. *Classroom instructional quality* combined three ratings of the classroom (richness of instructional methods, productive use of instructional time, and evaluative feedback; α = .77). These two scores were correlated (r = .56) and were combined through a mean of z-scores. Higher scores represented higher quality classrooms.

Teacher- reported classroom quality (5th and 6th grade). Teachers in both grades responded to two scales rating their relationship with the child participant and their self-efficacy. *Relationship with the child participant* was assessed using a 15-item rating scale, which appraised the level of closeness and conflict between the teacher and the child (Walters & Deane, 1985). Teachers recorded their responses on a 5-item Likert scale indicating how much they agree with items such as, "I share affection and warm relationship with the child" or "The child easily becomes angry at me." A total score was calculated by reverse-coding the conflict items and calculating a mean score (5^{th} grade: N = 890, α = .88; 6^{th} grade: N = 841, α = .88). Higher scores represent a better relationship with the participant.

In both fifth and sixth grade, teachers reported on their *sense of efficacy* to instruct their students, discipline their students and create a positive learning experience. Self-efficacy was assessed through a 19-item rating scale with responses recorded on a 9-point Likert scale. The three subscales focused on teachers' ability to teach their students new material and skills (e.g. "How much can you do to promote learning where there is lack of support from the home?;" 9 items; 5^{th} grade: N = 890, α = .86; 6^{th} grade: N = 827, α = .87), their ability to create order in the classroom (e.g. "How much can you do to get

children to follow classroom rules?;" 3 items, 5th grade: N = 890, α = .77; 6th grade: N= 827, α = .74) and their ability to create a positive learning environment (e.g. "How much can you do to make the school a safe place?;" 5th grade: 6 items; N = 890, α = .79; 6th grade: N = 833, α = .81).

The three self-efficacy scores and the single score of relationship with child were related to one another with adequate reliability (5th grade: α = .63; 6th grade: α = .64) and were combined through a mean of z-scores into a single indicator of teacher-rated classroom quality. Higher scores represent higher-quality classrooms.

School proportion of minority and poor students, and school size (5th and 6th grade). Each school data-file included the total enrollment, number of White students, and number of students on free-or-reduced-price lunch. These indicators were combined to calculate each school's *percent of student body that is not white* ((1 – Number of White students) / Total enrollment) and *percent of poor students* (Number of students on free-or-reduced price lunch / Total enrollment). The two indicators were correlated (r = .69 and .71, for 5th and 6th grade respectively) and were combined through a mean of z-scores to form one indicator of the prevalence of minority and poor students in the school. Higher scores represent schools with a higher proportion of minority and poor students. Analogously, I used the indicator of total enrollment as an indicator of *school size*; this indicator was divided by 1000 to reduce its variance.

Youth Functioning

Four indicators of youth functioning were assessed: (1) in fifth grade, participants completed a standardized achievement test, (2) in fifth and sixth grade, teachers rated participants' academic performance on six subjects, (3) two measures of engagement in school (i.e., in fifth grade youth rated their sense of school attachment, and in sixth grade

they rated their sense of school involvement; these items indicate similar, but not identical, concepts of being involved in and liking schools), and (4) in sixth grade, youth rated their sense of competence in math and English and their expected school attainment.

Tested achievement (3rd and 5th grade). In fifth grade, participants were given the *Woodcock-Johnson Psycho-Educational Battery – Revised* (WJ-R; Woodcock & Johnson, 1989, 1990). Two composite scores were used from this test: broad reading and broad math score. Broad reading score represented a composite of letter-word identification and passage comprehension scores (N = 918; 100 items; α = .91) and broad math represented a composite of scores from calculation and applied problems (N = 918; 118 items; α = .91). These two scores were correlated (r = .64) and combined through a mean of z-scores. Higher scores represent higher achievement.

A tested achievement score was also created from youths' third grade test (broad reading: N = 919; 100 items; α = .93; broad math: N = 921; 118 items; α = .89). As in fifth grade, these two scores were correlated (r = .70) and combined through mean of z-scores. The third and fifth grade measures of achievement were highly correlated (r = .88), and the third grade score was used as a covariate in all analyses involving youth functioning.

Teacher-rated achievement (3rd, 5th and 6th grade). In fifth and sixth grade, teachers filled out a *Mock Report Card*. A subscale on this measure asked the teachers to rate the child on a 5-point scale ranging from "below grade level" to "excellent" on six subjects: reading, oral language, written language, math, social studies, and science. These six scores were combined through a mean of z-scores to create an overall score of teacher-rated performance (5^{th} grade: N = 891, α = .95; 6^{th} grade: N = 839, α = .95). Higher scores represent better performance.

The same measure of teacher-rated achievement was collected in 3rd grade (N = 902, α = .95), and an overall score was calculated through a mean of z-scores. The third and fifth grade measures of achievement were correlated (r = .72), and the third grade score was used as a covariate in all analyses involving indicators of youth functioning.

School attachment (5th grade). In fifth grade, youth reported on the degree to which they felt competent in school (e.g., "I do well in school, even in hard subjects."), motivated [e.g., "School bores me" (reverse-coded)], and socially competent (e.g., "I feel very close to at least one of my teachers."). This 20-item scale recorded responses on a 4-point Likert scale. The items were combined through a mean of z-scores (N = 946; α = .85). Higher scores represent a closer attachment to school.

School involvement (6th grade). In sixth grade, children reported on their level of school involvement. This measure focuses on school attachment (e.g., "I am happy to be at my school;" N=938; 6 items, α = .74), teacher bonding (e.g., "I care what my teacher(s) think of me;" N=938; 3 items; α = .61), school activity participation [e.g., "I take part in extracurricular activities (sports, clubs, interest groups) at my school;" N=936; 2 items; α = .69], and negative affect toward school (e.g. "I feel lost at my school;" N=938; 6 items; α = .71). The four subscales showed adequate reliability (4 items; α = .65), so they were combined through mean of z-scores (negative affect was reverse-scored) to a single score of school involvement. Higher scores represent higher involvement.

Perceived self-competence (6th grade). Adolescents in sixth grade answered a 12-item scale focusing on their perception of *efficacy and competence* in English and math. Participants answered six questions for math (N = 942; α =.82) and for English (N = 942; α =.82), focusing on their perceived competence and the value they assigned to

excelling in the subject. These items were adapted from Self and Task Perception Questionnaire (Jacobs et al., 2002).

Three additional questions asked about the participants' perceived likelihood that they would finish high school and go to college and eventually graduate college (Cook, Church, Ajanaku, Shadish, Kim, & Cohen 1996); the three *attainment* questions resulted in one attainment score. The attainment score and the two competence items were reliably related (α = .52) and were combined through a mean of z-scores to create a single score of perceived self-competence. Higher scores represent higher perceived competence.

Covariates

Three types of covariates were used to counteract selection bias: third-grade tested and teacher-rated achievement (see Youth functioning section, above), demographics, and income-to-needs ratio.

Demographics. A number of demographic information reported by the participants' mothers were used as covariates. When the child was one month old, the mother indicated the child's *sex*, *race*, and her own level of *education* (in years), each as a single item.

Income-to-needs ratio. Mothers reported on their household income when the child was 1, 6, 15, 24, 36, and 54 months old, and annually after that through the sixth grade. At each of these assessments, income was divided by the then current federal poverty line to calculate income-to-needs ratios. These ratios were then averaged to create an overall mean income-to-needs ratio for the child's first eleven years of life. The overall score was log-transformed to address a significant positive skew.

ANALYTICAL STRATEGY

In the present study, I focused on the role of timing of school-level transition and school-characteristics in predicting youth functioning. The focus was not on mean differences in youth functioning, but rather the relative contribution of the two predictors in a statistically controlled environment. The conceptual model, based on Eccles' (2004) suggestions, led to the following predictions: (1) transition timing will be related to youth functioning, (2) school characteristics will mediate the effects of transition timing on youth functioning and (3) youths' gender will moderate relationships between school characteristics and youth functioning. Specifically, school transitions will be more strongly related to youth functioning for boys than for girls (Figure 2).

All analyses were performed in the regression framework. The regression residuals of the analyses generally failed the normality assumption and sporadically the independence assumption, prompting a decision to use maximum-likelihood estimation with robust standard errors and chi-squares (MLR estimator). This estimation method is robust against non-compliant residuals.

All analyses accounted for children being nested in schools and estimated missing data. Because two participants in the same school would have identical or similar school characteristics, I used a school ID (or where unavailable, a principal ID) to identify clusters of youth and corrected standard errors accordingly. To address any bias introduced by missing data, I used full information maximum likelihood estimation.

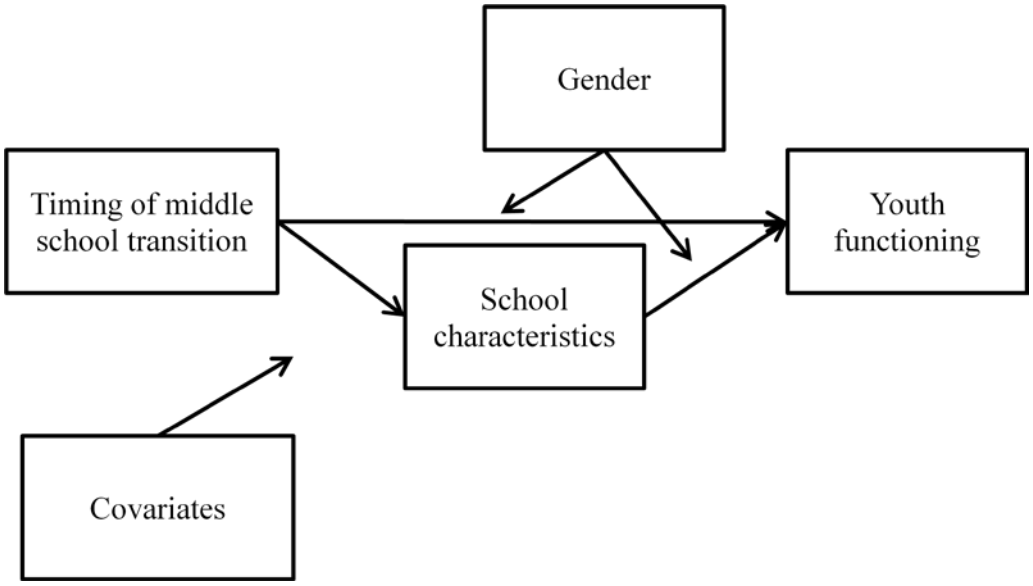

Figure 2. Conceptual model of the present study.

All analyses were performed separately for fifth and sixth grade, with and without covariates. Child's race, mother's education, family's income-to-needs ratio and the data collection sites were used as covariates for all variables. Additionally, child's gender was used as an added covariate for classroom quality indicators and youth functioning, and youths' tested and teacher-reported achievement in third grade were used as covariates to the youth functioning indicators. Data were prepared in SAS 9.1, and analyses were performed in Mplus 5.2.

The analyses were conducted in several steps. First, the covariates were used to predict membership in the transition group to uncover any imbalance in participants' chances of selecting into any of the groups. Because transition group (a categorical variable) was the dependent variable in these analyses, I used multinomial logistic regression, with rotation through all three contrasts (Hosmer & Lemeshow, 2000).

Next, transition group membership was tested as a predictor of youth outcomes (research question 1) and school characteristics (research question 2). School characteristics were then tested as predictors of youth functioning, and a full meditational model was tested with transition group membership as a categorical predictor, school characteristics as continuous mediators, and youth functioning as continuous outcomes (research question 3). The analyses were all linear regressions; when applicable, contrasts of the categorical predictors were rotated by examining each category in turn as the omitted variable. In the full model, I assessed total, direct, and indirect effects in the model with covariates.

Although the mediation model spans two levels of analysis (individual and school), two factors shaped the decision not to pursue a multilevel model: (1) only 118 participants (12%) had another participant in the same school, preventing effective school-level analysis; (2) Bauer, Preacher and Gil's (2006) contend that in analyses where predictor and mediator are both on the school-level, and only the outcome is on the individual level, estimation of random effects is not necessary.

Finally, to examine gender as a moderator of the relations in the model, I compared models for boys and girls (research question 4). Continuing the use of linear regression and path analysis, I constrained the paths between group membership and youth functioning and the paths between school characteristics and youth functioning to be equal and assessed whether model fit decreased by comparison to a model in which paths were allowed to vary freely for the two genders.

Chapter 3: Results

PREDICTORS OF TRANSITION GROUP MEMBERSHIP

The initial analyses determined whether participants had uneven chances of being in a particular transition group, given their demographics and prior tested achievement. As shown in Table 2, with few exceptions, the three transition groups were not distinguished based on participants' characteristics: (1) Latinos were somewhat less likely to be in the early transition than the late transition group; (2) African American participants were more likely to be members of the early or standard transition groups than the late transition group; and (3) participants with higher tested achievement in third grade were more likely to be members of the standard transition group than of the late transition group.

Some of the differences were explained by data collection site. Sites varied in the percent of students in different transition groups, presumably because the timing of middle school entry depends on school policies that are community-wide. The sites also varied in participants' demographic backgrounds, and to the extent that a particular transition group was unequally represented across the sites, the differences between the sites and the transition groups became confounded. When the sites were accounted for, the unequal distribution of Latinos was explained (*ß* = -.01, *OR* = .82, *ns*), and African Americans were no longer more likely to be in the early transition than in the late transition group (*ß* = .06, *OR* = 1.90, *ns*). However, African Americans, as well as those with higher prior tested achievement, were still somewhat more likely to be in the standard transition group than the late transition group (*ß* = .20, *OR* = 1.64, $p < .10$ and *ß* = .24, *OR* = 1.22, $p < .10$ for African Americans and higher achieving participants, respectively).

Table 2. Multinomial logistic regression predicting school transition group membership from demographic variables (data collection sites not included)

				95% Confidence Intervals	
	Std. Coeff.	Std. Error	O.R.	Low	High
Early transition (reference: late transition)					
Female	-0.07	0.28	0.94	0.60	1.47
Black	0.69*	0.33	2.44	0.89	6.69
Latino	-0.64^{+}	0.36	0.32	0.08	1.34
Mother education	-0.05	0.36	0.99	0.88	1.12
Income-to-needs (log)	0.13	0.40	1.08	0.69	1.69
Tested achievement in 3rd grade	0.36	0.39	1.18	0.83	1.68
Teacher-rated ach. in 3rd grade	0.21	0.47	1.10	0.72	1.69
Standard transition (reference: late transition)					
Female	0.10	0.24	1.06	1.06	1.40
Black	0.78***	0.21	2.08	2.08	3.68
Latino	-0.36	0.22	0.63	0.63	1.14
Mother education	-0.30	0.33	0.96	0.96	1.05
Income-to-needs (log)	0.09	0.35	1.04	1.04	1.37
Tested achievement in 3rd grade	0.67*	0.31	1.24	1.24	1.55
Teacher-rated ach. in 3rd grade	-0.52	0.34	0.84	0.84	1.06
Early transition (reference: standard transition)					
Female	-0.14	0.32	0.91	0.60	1.38
Black	0.43	0.45	1.55	0.61	3.99
Latino	-0.66	0.44	0.40	0.10	1.67
Mother education	0.08	0.43	1.01	0.90	1.13
Income-to-needs (log)	0.12	0.48	1.06	0.69	1.61
Tested achievement in 3rd grade	0.12	0.48	1.04	0.75	1.46
Teacher-rated ach. in 3rd grade	0.53	0.57	1.21	0.82	1.80

Note. $^{+}$ $p < .10$; * $p < .05$ *** $p < .01$

TRANSITION GROUPS AND YOUTH FUNCTIONING

The initial research question was whether children in middle schools exhibit different functioning from their same-grade peers in elementary school. By and large, the achievement, school involvement, and self-perceived competence scores in the three groups were similar in both the fifth and sixth grade analyses. There was some evidence that the standard and late transition groups differed in fifth grade, before they entered middle school.

Fifth grade. The contrasts of interest in fifth grade were between the early transition group (in middle school) and the other two groups (still in elementary school). The results in fifth grade are shown in the left panel of Table 3. The contrasts between the early transition groups and the other two groups show no significant differences on any of the dependent variables, but students in early transition group show a marginal trend for lower teacher rated achievement than students in the late transition group. The results are largely similar with and without covariates. There were no differences found between the two groups still in elementary school (standard and late).

Sixth grade. In sixth grade, early and standard transitioning youth were in middle school, whereas late transitioning youth were still in elementary school. Hence, the contrasts of interest were those comparing early and standard transition children to late transition children. The results are shown in the right panel of Table 3.

Most of the measured dependent variables in this grade were different than those measured in fifth grade. Tested achievement was not measured, and the youth in all three groups remained similar to one another on their teacher-rated achievement, but the standard transition group, who were in their first year of middle school, had significantly

lower school involvement than did the late transition group, who were still in elementary school.

TRANSITION GROUPS AND SCHOOL CHARACTERISTICS

The second research question concerned the characteristics of elementary and middle schools. As expected, once youth entered middle schools (early transition group in fifth, and early and standard transition groups in sixth grade), they entered larger schools. Otherwise, the schools attended by the three groups were similar.

Fifth grade. In fifth grade, the major difference occurred in school size. Fifth graders in the early transition group, who were in middle school, attended larger schools than did the other two groups. Second, the standard transitioning youth attended elementary schools with a higher percentage of minority and poor students than did youth in the early and late transition groups. There were no significant differences on either measure of classroom quality (Table 4, left panel).

Sixth grade. The comparisons of the three groups in sixth grade are shown in the right panel of Table 4. Both early and standard transition groups (in middle school) attended schools that were larger than the elementary schools attended by the late transition group. The middle schools attended by early transitioning youth had lower proportions of minority and poor students than the elementary schools attended by the late transitioning youth, but this difference became only marginally significant when covariates were accounted for. The standard transitioning youth attended middle schools with lower teacher-rated classroom quality than the elementary schools attended by late transitioning youth, but again, this difference was explained by the covariates.

Table 3. Linear regression predicting academic outcomes from transition group membership

	Fifth grade analyses[a] (N = 961)			Sixth grade analyses[b] (N = 869)		
	Tested achievement	Teacher-rated achievement	School attachment	Teacher-rated achievement	School involvement	Perceived school competence
	Std. coef. (S.E.)	Std. coef (S.E.)	Std. coef. (S.E.)	Std. coef (S.E.)	Std. coef. (S.E.)	Std. coef (S.E.)
Early transition (reference: late transition)						
No covariates	-0.02 (0.03)	-0.03 (0.03)	-0.01 (0.03)	0.07 (0.04)$^{+}$	-0.04 (0.04)	0.03 (0.04)
Covariates[c]	0.01 (0.02)	-0.04 (0.03)$^{+}$	0.02 (0.03)	0.06 (0.04)$^{+}$	-0.05 (0.04)	0.02 (0.03)
Standard transition (reference: late transition)						
No covariates	-0.01 (0.03)	-0.03 (0.03)	0.01 (0.03)	0.02 (0.03)	-0.07 (0.04)*	0.04 (0.04)
Covariates[c]	0.01 (0.02)	-0.00 (0.03)$^{+}$	0.03 (0.03)	0.03 (0.03)	-0.09 (0.04)*	0.03 (0.03)
Early transition (reference: standard transition)						
No covariates	0.03 (0.03)	0.05 (0.04)	-0.02 (0.04)	0.05 (0.04)	0.01 (0.04)	0.07 (0.05)
Covariates[c]	-0.01 (0.02)	-0.01 (0.02)	-0.04 (0.03)	0.04 (0.03)	0.02 (0.03)	0.00 (0.03)

Note. [a] Early transition youth are in middle school, the other two groups are still in elementary school; The contrasts of interest compare the early transition group to standard (right column) and late (left column) transition groups; [b] Early and standard transition youth are in middle schools, and late transition youth is in elementary; The contrasts of interest compare the early and standard transition groups to late transition group (left and center columns respectively for early and standard transition groups); [c] Covariates are: child race, child gender, child's tested and teacher-rated achievement in third grade, mother's education, family income to needs (log), and data collection site; $^{+}$ $p < .10$; * $p < .05$;

The middle schools attended by early and standard transitioning youth differed from each other in some respects. The standard-transition middle schools were larger than those attended by early transitioning youth. The standard transition middle schools also had a higher percentage of minority and poor students than did the early transition schools, but this difference was explained by the covariates.

THE ROLE OF SCHOOL CHARACTERISTICS IN PREDICTING YOUTH FUNCTIONING

The third research question was whether variations in school characteristics explain any effects of school-level on youth achievement and school functioning. This meditational question was addressed in two steps. First, I explored whether school characteristics predicted youth functioning; then, I used school characteristics in a path analysis as a mediator between transition group membership and youth functioning.

Do school characteristics predict youth functioning?

Overall, classroom quality emerged as an important predictor of youth functioning. Schools' percentage of minority and poor students showed some relations to the dependent variables, but surprisingly, some were positive. School size predicted lower functioning on some measures.

Fifth grade. In this step of the analyses, observed and teacher-rated classroom quality, school percent of minority and poor students, and school size were examined as predictors of youths' tested achievement, teacher-rated achievement and school attachment. Observed classroom quality predicted higher tested achievement in the absence ($ß = .17$, $p < .001$) and presence of covariates ($ß = .08$, $p < .001$). In the absence of covariates, higher observed classroom quality also predicted higher teacher-rated achievement ($ß = .08$, $p < .05$) and school attachment ($ß = .07$, $p < .05$), but these effects

Table 4. Linear regression predicting school indicators from transition group membership

	Fifth grade analysis[a] (N = 961)				Sixth grade analysis (N = 869)		
	Observed Classroom Quality[cd]	Teacher-rated classroom quality[cd]	School percent minority and poor[c]	School size[c]	Teacher-rated classroom quality[cd]	School percent minority and poor[c]	School size[c]
	Std. coef. (S.E.)	Std. coef. (S.E.)	Std. coef. (S.E.)	Std. coef. (S.E.)	Std. coef. (S.E.)	Std. coef. (S.E.)	Std. coef. (S.E.)
Early transition (reference: late transition)							
No covariates	-0.03 (0.04)	-0.00 (0.05)	-0.05 (0.05)	0.20 (0.05)***	-0.04 (0.04)	-0.16 (0.06)**	0.14 (0.05)**
Covariates[c]	-0.01 (0.03)	0.01 (0.04)	-0.02 (0.03)	0.24 (0.05)***	-0.01 (0.04)	-0.09 (0.05)$^{+}$	0.16 (0.05)**
Standard transition (reference: late transition)							
No covariates	0.02 (0.04)	0.00 (0.04)	0.08 (0.04)*	-0.01 (0.04)	-0.08 (0.04)*	-0.05 (0.05)	0.39 (0.04)***
Covariates[c]	0.05 (0.04)	0.03 (0.03)	0.08 (0.04)*	0.02 (0.04)	-0.04 (0.04)	-0.03 (0.05)	0.41 (0.05)***
Early transition (reference: standard transition)							
No covariates	-0.04 (0.04)	-0.00 (0.05)	-0.10 (0.05)*	0.20 (0.05)***	0.02 (0.04)	-0.13 (0.06)*	-0.11 (0.05)*
Covariates[c]	-0.04 (0.03)	-0.01 (0.04)	-0.06 (0.03)*	0.20 (0.05)***	0.03 (0.05)	-0.07 (0.04)	-0.10 (0.05)*

Note. [a] Early transition youth are in middle school, the other two groups are still in elementary school; The contrasts of interest compare the early transition group to standard (right column) and late (left column) transition groups; [b] Early and standard transition youth are in middle schools, and late transition youth is in elementary; The contrasts of interest compare the early and standard transition groups to late transition group (left and center columns respectively for early and standard transition groups); [c] Covariates are: child race, mother's education, family income-to-needs (log), and data collection site; [d] Additional covariate: child gender; * $p < .05$; ** $p < .01$; *** $p < .001$

disappeared when covariates were included in the model (ß = .00, *ns* and ß = .05, *ns* for teacher-rated achievement and school attachment, respectively).

Teacher-rated classroom quality showed no relation to tested achievement (ß = .05, *ns* and ß = .00, *ns* for analyses without and with covariates, respectively), but predicted higher teacher-rated achievement (ß = .20, $p < .001$ and ß = .11, $p < .001$ for analyses without and with covariates, respectively) and higher school attachment (ß = .12, $p < .001$ and ß = .09, $p < .01$ for analyses without and with covariates, respectively).

Schools' percentage of minority and poor students predicted lower tested achievement, but this effect was explained by covariates (ß = -.22, $p < .001$ and ß = -.02, *ns* for analyses without and with covariates, respectively). Similarly, the schools' proportion of minority and poor students predicted lower teacher-rated achievement in the absence of covariates (ß = -.15, $p < .001$), but the addition of covariates led to a significant positive relation (ß = .07, $p < .05$). This reversal of effect suggests that children in schools with high proportions of minority and poor students performed better than comparable students performed in schools with lower percentages of minority and poor children.

Finally, children in larger schools had higher levels of tested achievement (ß = .36, $p < .01$ and ß = .05, $p < .05$ for analyses without and with covariates, respectively) than their peers in smaller schools. Larger school size had no relation to teacher-rated achievement (ß = .12, *ns* and ß = .01, *ns* for analyses without and with covariates, respectively), and predicted lower levels of school attachment, but only in the absence of covariates (ß = -.26, $p < .05$ and ß = -.06, *ns* for analyses without and with covariates, respectively).

Sixth grade. In sixth grade, teacher-rated classroom quality predicted higher teacher-rated achievement (ß = .21, $p < .001$ and ß = .12, $p < .001$ for analyses without

and with covariates, respectively), higher school engagement (ß = .17, $p < .001$ and ß = .13, $p < .01$ for analyses without and with covariates, respectively), and higher perceived school competence (ß = .14, $p < .01$ and ß = .09, $p < .05$ for analyses without and with covariates, respectively).

Schools' percent of minority and poor students predicted lower achievement in the absence of covariates, but higher achievement in their presence (ß = -.10, $p < .05$ and ß = .08, $p < .05$ for analyses without and with covariates, respectively) — a pattern that was also observed in fifth grade. The percentage of minority and poor students predicted lower school engagement (ß = -.16, $p < .05$), and this effect was attenuated to a marginal significance in the presence of covariates (ß = -.09, $p < .10$). There was no effect on perceived school competence (ß = -.04, ns and ß = .04, ns for analyses without and with covariates, respectively).

Finally, students in larger schools did not differ from their peers in smaller schools in their teacher-rated achievement (ß = .03, *ns* and ß = .03, *ns* for analyses without and with covariates, respectively), but had lower school engagement (ß = -.12, $p < .01$ and ß = - .14, $p < .01$ for analyses without and with covariates, respectively). School size had no relation to perceived school competence (ß = .05, *ns* and ß = .04, *ns* for analyses without and with covariates, respectively).

Do school characteristics mediate the effects of transition group?

The final analysis was designed to determine whether observed differences in student functioning could be explained by school characteristics. In the analyses reported above, most indicators pointed to overwhelming similarity in functioning of the students in the three groups (see Tables 3 and 4). The absence of relation between transition groups and dependent variables failed one of the key Baron and Kenny (1986)

requirements for mediation. However, as detailed by MacKinnon, Fairchild, and Fritz (2007), multiple mediation models where the mediated effects are not in the same direction (e.g., higher classroom quality predict better functioning, but larger schools predict lower functioning), the direct effects can be obscured by these "inconsistent mediators."

To determine whether the differences among the transition groups could be explained by school characteristics, a full meditational path-model was computed. All analyses presented below include only contrasts across school level, and all were conducted in the presence of covariates. Full models with and without covariates can be found in the Appendix (Tables A2 and A3 for fifth and sixth grade analyses, respectively).

Fifth grade. When the early transition group (in middle school) was contrasted with the standard and late transition groups (in elementary school), there were no significant direct effects on any of the dependent variables (see Figure 3). The early transition group attended larger schools than either of the other groups and attended school with lower proportion of poor and minority students than the standard transition group. School characteristics consistently predicted the dependent variables: Observed classroom quality predicted higher tested achievement, teacher-rated classroom quality predicted higher teacher-rated achievement and higher school attachment, a higher percentage of poor and minority students in schools predicted higher school attachment, and larger schools predicted higher tested achievement.

The analysis of direct and indirect effects, presented in Table 5, showed weak support for direct or indirect effects of transition groups. Students in the early transition group had a marginally higher tested achievement mediated through the larger schools they attended. No other effects reached significance.

Sixth grade. In sixth grade, the comparison of early and standard transition (in middle school) had marginally higher teacher-rated achievement than did the late transition group (in elementary school). As shown in Figure 4, the two groups in middle school (early and standard transition) attended larger schools than their peers in elementary schools (late transition). Additionally, the middle schools attended by youth in the early transition group had lower proportions of poor and minority students than the elementary schools attended by late transitioning youth.

Dependent variables were, once again, reliably predicted by indicators of school characteristics. In the presence of covariates, higher teacher-rated achievement was predicted by higher teacher-rated classroom quality and a higher proportion of minority and poor students in schools. School engagement was predicted by higher teacher-rated classroom quality and a lower percentage of minority and poor students. Finally, perceived school competence was predicted by higher teacher-rated achievement.

Analysis of direct and indirect effects, shown in Table 6, revealed that the early transition students' marginally higher teacher rated achievement, compared to late transition, was a direct effect not mediated through school characteristics. Lower levels of school engagement in the early and standard transition groups (in middle school), compared to the late transition group) were also mediated by school size. This effect was marginal for the early transition group and significant for the standard transition group. There were no significant direct or indirect effects on perceived school competence.

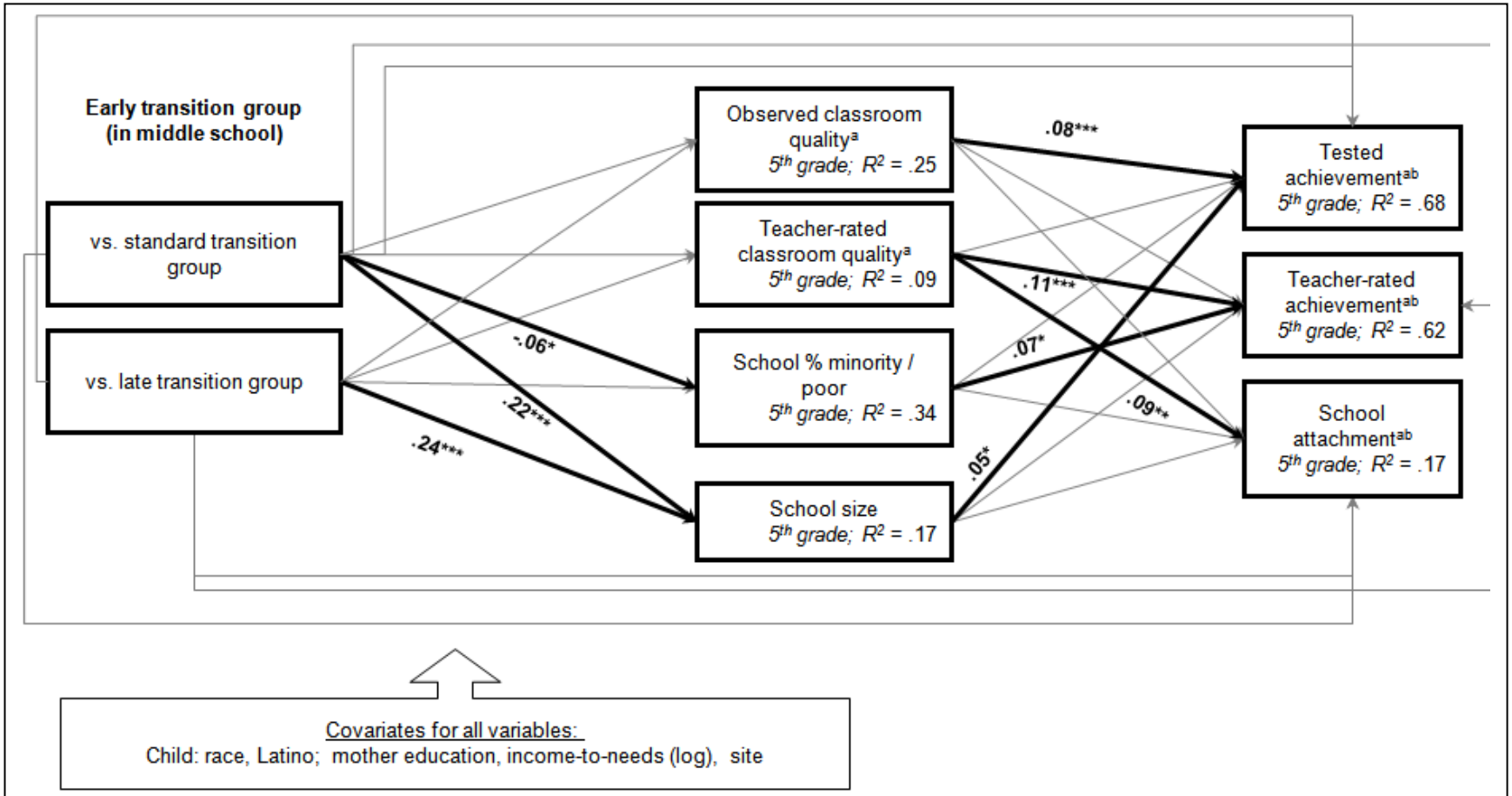

Figure 3. Path analysis of the mediation of the effects of transition group membership through school characteristics on youth functioning in fifth grade (Model fit: χ^2 / *df* = 3.46; *CFI* = 0.99; *TLI* = 0.89; *RMSEA* = .05; *ns*).

Note. Paths with $p < .10$ are highlighted black and their standardized coefficients are shown; other tested paths are shown in grey; All analyses ran with covariates: child race, mother's education, family income-to-needs (log), and data collection site; [a] Added covariate: gender; [b] added covariates: third grade tested and teacher-rated achievement; *= $p < .05$, ** = $p < .01$,*** = $p < .001$

Table 5. Specific effects group membership in fifth grade[c]

	Tested achievement[de]	Teacher-rated achievement[de]	School attachment[de]
	Std Coefficient (S.E.)	Std Coefficient (S.E.)	Std Coefficient (S.E.)
Early transition (reference: late transition[a])			
Total effect	0.02 (0.02)	0.03 (0.02)	-0.01 (0.03)
Total indirect	0.01 (0.01)	-0.00 (0.01)	-0.01 (0.01)
Trough observed classroom quality[d]	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Through teacher-rated classroom quality	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Through percent minority/poor	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Through school size	0.01 (0.01)	0.00 (0.01)	-0.01 (0.01)
Total direct	0.01 (0.01)	-0.03 (0.02)	0.00 (0.04)
Early transition (Reference: standard transition[a])			
Total effect	-0.01 (0.02)	0.02 (0.02)	-0.03 (0.03)
Total indirect	0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)
Trough observed classroom quality[d]	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Through teacher-rated classroom quality	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Through percent minority/poor	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Through school size	0.01 (0.01)$^{+}$	0.00 (0.01)	-0.01 (0.01)
Total direct	-0.01 (0.02)	0.02 (0.02)	0.02 (0.03)

Note. [a] In elementary school; [b] In middle school; [c] Covariates included in all analyses: child race, mother's education, family income-to-needs (log), and data collection site; [d] Added covariate: child gender; [e] Added covariates: 3rd grade tested and teacher-rated achievement; $^{+}$ $p < .10$

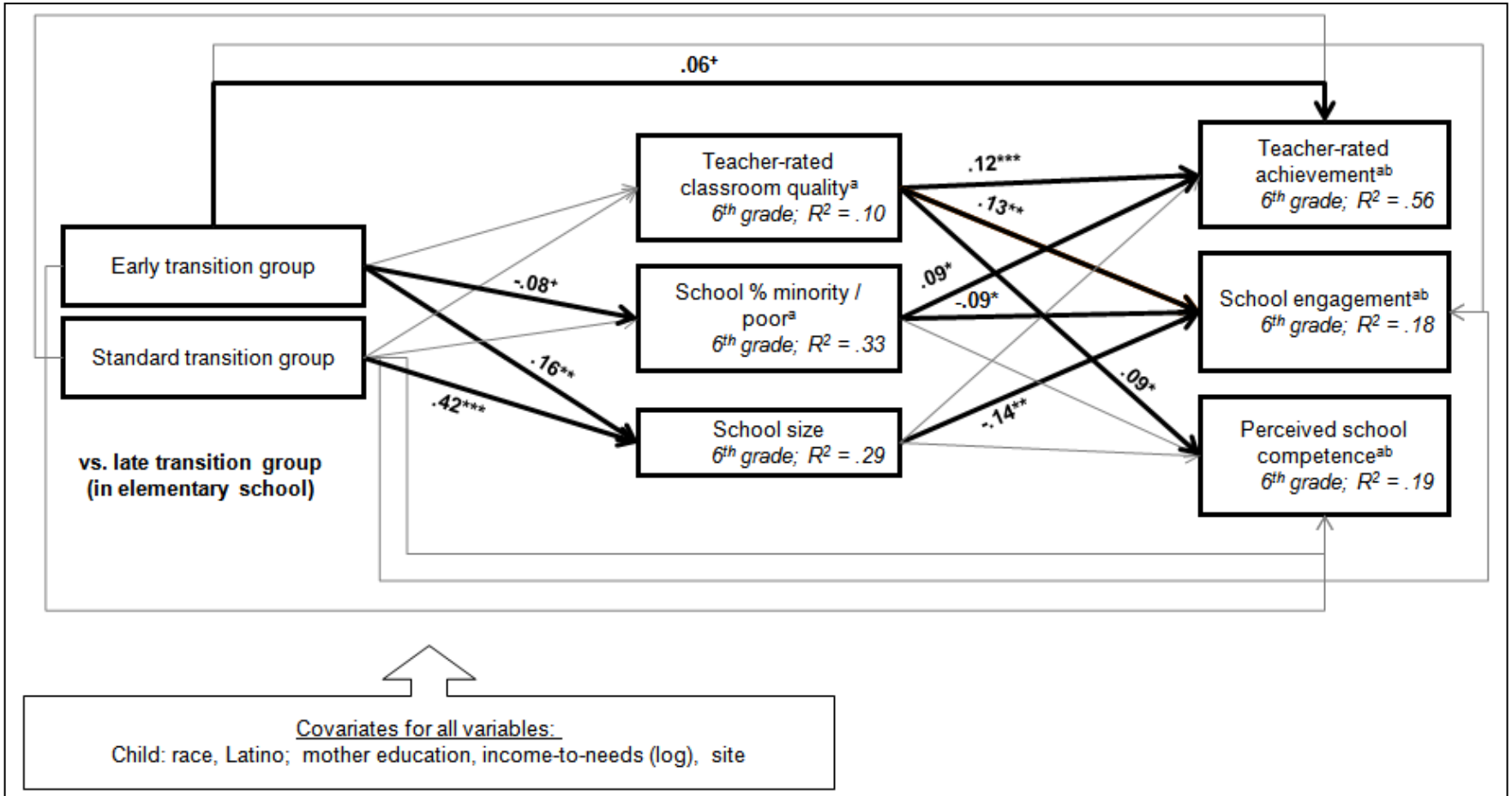

Figure 4. Path analysis of the mediation of the effects of transition group membership through school characteristics on youth functioning in sixth grade (Model fit: χ^2 / *df* = 0.68; *CFI* = 1.00; *TLI* = 1.00; *RMSEA* = 0.00, *ns*).

Note. Paths with $p < .10$ are highlighted black and their standardized coefficients are shown; other tested paths are shown in grey; All analyses ran with covariates: child race, mother's education, family income-to-needs (log), and data collection site; [a] Added covariate: gender; [b] added covariates: third grade tested and teacher-rated achievement; *= $p < .05$, ** = $p < .01$,*** = $p < .001$

Table 6. Specific effects of group membership in sixth grade[c]

	Teacher-rated achievement[de]	School involvement[de]	Perceived school competence[de]
	Std Coefficient (S.E.)	Std Coefficient (S.E.)	Std Coefficient (S.E.)
Early transition[b] (Reference: late transition[a])			
Total effect	0.05 (0.03)$^{+}$	-0.04 (0.04)	0.02 (0.03)
Total indirect	-0.00 (0.01)	-0.02 (0.02)	0.00 (0.01)
Through teacher-rated classroom quality[d]	0.00 (0.01)	-0.00 (0.00)	0.00 (0.00)
Through percent minority/poor	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.00)
Through school size	0.00 (0.01)	-0.02 (0.01)$^{+}$	0.01 (0.01)
Total direct	0.06 (0.03)$^{+}$	-0.03 (0.04)	0.02 (0.03)
Standard transition[b] (Reference: late transition[a])			
Total effect	0.03 (0.03)	-0.09 (0.04)*	0.03 (0.03)
Total indirect	0.00 (0.02)	-0.06 (0.02)**	0.01 (0.02)
Through teacher-rated classroom quality[d]	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.00)
Through percent minority/poor	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.00)
Through school size	0.01 (0.02)	-0.06 (0.02)**	0.02 (0.02)
Total direct	0.03 (0.03)	-0.03 (0.05)	0.02 (0.04)

Note. Note. [a] In elementary school; [b] In middle school; [c] Covariates included in all analyses: child race, mother's education, family income-to-needs (log), and data collection site; [d] Added covariate: child gender; [e] Added covariates: 3rd grade tested and teacer-rated achievement; $^{+}$ $p < .10$; * $p < .05$; ** $p < .01$;

GENDER AS A MODERATOR OF EFFECTS ON YOUTH FUNCTIONING

The fourth research question was whether the relations of school level or school characteristics to youth achievement and school functioning differed by student gender. To answer this question, I used multiple-group comparison methods to compare the full model for boys and girls. I compared the model fit of a model where all pathways were allowed to vary for the two genders with the fit of a model where all pathways were constrained to be equal. Due to the fact that children were nested in schools, I used the Satorra-Bentler adjusted chi-square test (Satorra, 2000). The results indicate that the structural models differed for boys and girls in fifth grade (χ^2 (26, N = 961) = 46.28; p < .01), but not in sixth (χ^2 (16, N = 869) = 17.52; *ns*).

To determine what aspects of the model differed for boys and girls, one path at a time was constrained to be equal. The gender variation emerged only in the relation between the school's percentage of minority and poor students and school attachment (χ^2 (1, N = 961) = 6.87; p < .01). For boys, school composition was not related to school attachment (β = -.10; *ns*), but for girls, a higher proportion of minority and poor students in their schools predicted higher school attachment (β = .13; p < .05).

Chapter 4: Discussion

The present study tested a conceptual model drawn from an extensive research showing that transition to middle school is associated with reduced achievement, school involvement and sense of competence. As summarized by Eccles (2004), the two primary explanations for this association centered on middle schools' lower quality (e.g., Eccles et al., 1993) and the mis-timed change in school context (e.g., Simmons & Blyth, 1987).

Although the two explanations can be combined into an ecological framework (Eccles, 2004), the results of this study highlight the point of disagreement between them: whereas Eccles and her colleagues (1993) would argue that high-quality middle schools do not necessarily impede students' functioning, Simmons and Blyth (1987) would disagree, because even these high-quality middle schools remove children from familiar context during a sensitive developmental period.

In the present study, students who had transitioned to middle school achieved test scores and grades similar to their same-grade peers in elementary schools. Based on prior research, children who had transitioned to middle school were expected to have lower levels of achievement (e.g., Gutman & Midgley, 2000). This prediction was not only unsupported, there is weak evidence for the opposite pattern— specifically, the test scores of some middle school students trended higher than those of same-grade students in elementary schools

Prior research found a consistent pattern of middle school students achieving below their same-grade elementary peers. For example Cook et al. (2008) explored the achievement of students in all schools of North Carolina and found that students in middle schools scored lower on achievement tests than their elementary school peers. This result was present even after Cook and his colleagues controlled for an exhaustive set of covariates. Similarly, Simmons and Blyth (1987) and Alspaugh and Harting (1995) found analogous patterns of results among their samples – students in middle schools achieved below their elementary school peers.

The lack of the expected difference in achievement between elementary and middle school students is unexpected and hard to interpret. Although the present study employed a comprehensive set of covariates and tested mediation through school quality, neither accounted for this relation. Moreover, as will be explored in further detail below, the design of this study lends considerable confidence to these null findings not being a result of a Type II error or another methodological problem.

Results of this study do support the prediction that children who had entered middle school in sixth grade had lower engagement in school than did their elementary school counterparts. This pattern was not significant for children who entered middle school in fifth grade; mediational analyses revealed that this relation may be partly due to the smaller size of middle schools that begin in fifth grade compared to schools that began in sixth grade.

Prior work and the present study alike, found middle schools to be larger, which accounted for the relation to lower school engagement. Simmons and Blyth (1987) found unique statistical relation between school engagement and both school size and school level, but Weis and Kipnes (2006) found only an effect of school size, regardless of school level. The finding in the present study aligns itself with Weiss and Kipness. The effect of school level (middle schools beginning in sixth grade) on engagement was fully mediated though school size. This finding indicates students in middle schools are less engaged than their elementary school peers because their schools are larger.

Students in sixth grade in the two school levels showed no difference in their perceived school competence in English and math. No prior works compared perceived school competence of elementary and middle school students in the same grade, so it is difficult to find a basis for comparison; however, relevant evidence suggests that students' school engagement may react to classroom quality more than to school transition. Midgley (Midgley et al., 1989b) and Freidel (Freidel et al., 2010) found that students who moved to middle school did not experience a

decline in their perceived school competence if their teachers continued to be highly efficacious. In the present study, middle school and elementary school teachers rated themselves as similarly efficacious, indicating that the lack of school-level difference on perceived competence perhaps tapped into the same mechanism as observed by Midgley and Freidel.

The middle schools attended by the students in this study were of comparable quality to the elementary schools. These findings are in contrast to much of the prior research. The model proposed by Eccles and her colleagues (1993) posited two major school characteristics that might account for reduced youth functioning after entering middle school. First, middle schools teachers generally maintained less orderly, warm, and cognitively stimulating classrooms than did the elementary school teachers a grade prior (Midgley et al., 1988). Middle school teachers also generally trusted their students less and felt less sure of their own ability to teach their students (Midgley et al., 1989a). Second, middle schools suffered from large and diverse student bodies, which lead to impersonal school environments with strict policies (Eccles et al. 1993).

There was no evidence for differences among the three school types in this study on classroom quality, as measured by either classroom observations or teacher ratings. Again, as will be discussed below, given the design of the present study (i.e., sample size and spread, statistical control), this result is likely reliable. Moreover, the measures of quality were from different informants and had the expected relations to achievement and school attachment/involvement, further indicating a valid finding.

Again, the interpretation of this null result is not easy. The present study included classroom observations not commonly included in research. These observations were complemented by teacher-reports of self- efficacy and relationship with the student participants, which are methodologically well aligned with prior work (e.g. Midgley et al., 1989b). Only a few studies conducted detailed comparisons of the classroom environment of elementary and middle schools in the same grade (see Simmons & Blyth, 1987 for an exception). Thus, the common

finding of declining classroom quality across the move to middle schools may have missed a similar cross-grade change in elementary school classrooms.

There were large structural differences, in school size and, to a lesser extent, in school composition between the school types. Overall, the middle schools were larger than elementary schools. In addition, middle schools beginning in sixth grade were larger and had more minority and poor students than middle schools that began in fifth grade. These findings are in line with prior work indicating a pooling of students from varied backgrounds into larger, more diverse institutions (e.g., Simmons & Blyth, 1987).

The present study sought to understand the role of school level and school characteristics in predicting youth functioning. In alignment with prior research, high quality classrooms contained youth who performed reliably better than their peers in lower quality classrooms (McCoy, 2005). Eccles and her colleagues (1993) argued articulately for the importance of well organized, cognitively stimulating, and caring classroom environment, accompanied by caring and efficacious teachers. The developing adolescents, they argued, need this space to satisfy their desire for autonomy; the need to be trusted to act responsibly on their own, without express rules set up by the adults around. The results of the present study cannot comment on the psychological processes of early adolescents, but their academic outcomes are still reliably related to the quality of their classrooms. The departure of this study from prior work stems from the fact that although classroom quality still reliably predicted all the dependent variables, high quality classrooms were evenly distributed across the three school types tested.

Further, some indicators of student functioning were predicted by an unexpected set of predictors. Students who began middle school in fifth grade had somewhat higher teacher-rated performance in sixth grade than students in elementary schools. In fifth grade, students in larger schools had higher test scores than students in smaller schools. These relations are difficult to explain without further inquiry. Students who began middle school in fifth grade may have

recovered from any "transition stress" or may have benefitted from the exposure to older peers and specialized teachers that helped them learn more than their peers in elementary schools. Similarly larger schools may be able to fund better equipped libraries or better, more specialized teachers. The data of this study does not allow me to explore any of these hypotheses in an empirical fashion, however, deferring authoritative explanation of these relations to future work.

Similarly unexpected was the finding that once students' own background was accounted for, their grades were higher in schools with higher proportion of minority and poor students than in more affluent, more predominantly White schools. Prior research found that students in schools with a larger number of minority and low-income students often achieved lower grades and were less attached to school than their peers in more white and well-off schools (e.g., Weiss & Kipnes, 2006). The present study found some support for the negative effect of school SES and racial composition on lower school engagement, but a contradictory relation to high grades.

One important factor in interpreting this relation may lie with the covariates. In both grades, school composition (higher proportion of minority and low income students) showed the expected negative relations to grades and test scores in the absence of covariates. In other words, this study found the expected mean difference in grades and tests scores between students in White and well-off schools and those in schools with higher ratio of minority and poor students. However, in this predominantly White and well-off sample, when participants' own background was accounted for (including their prior achievement), the relations of school composition to test scores disappeared and that of school composition and grades reversed.

It is important to highlight the inclusion of prior grades and test scores among the covariates, as it meant that the analyses measured residualized change, which is defined as measuring how students' achievement compared above and beyond prior differences. Although the set of covariates generally did not alter the measured relations among variables, in this case covariates do seem to play a role. In such context it is possible that the inclusion of prior

achievement is important; higher school proportion of minority and poor students was related to students' grades growing more or declining less.

Third, prior research articulated a relation between diverse student bodies, lack of teacher-student trust, and cool teacher-student relationship (Simmons & Blyth, 1987). The present study measures school composition net of a direct measure of teacher-student relationship and other indicators of classroom process. Net of all these factors – net of students' background, net of prior achievement, and net of classroom climate – being exposed to a diverse student body related to students' higher teacher-rated performance.

A more detailed perspective on school composition may be needed. In the present study, I relied on a joint measure of schools' percentage of ethnic minority and low-income students. Benner and Graham (2009) used a measure with a more complex definition, weighing the size of a student's same-ethnicity group with the total number of ethnic and racial groups in the school. This in-group perspective of school diversity may allow a greater understanding of the processes surrounding the interplay of students' background and the backgrounds of their school mates. However, most of our sample was White and not poor, so the higher proportions of minority and poor students in our participants' schools likely reduced their ethnic and economic in-group, which should have reduced achievement, but did not.s

The patterns of relation were largely consistent for boys and girls. Girls' (but not boys') engagement in sixth grade benefited from schools with a higher percent of poor and minority students. In prior work by Akos and Galassi (2004), boys also tended to experience a lower connection to school (a concept similar to school engagement of the present study) after the transition to middle school. The results from this study present a similar pattern. Akos and Galassi hypothesized that the difference in school connectedness could be explained by parallel changes in students' achievement (which they did not measure; Osterman, 2000). The findings of

the present study indicate that the differences in school engagement are present net of differences in achievement (which was similar for boys and girls).

Why do results not confirm earlier findings of low quality middle schools full of struggling students? This study employed some distinct methodological features that may account for some of the unexpected results. I compared multiple groups of students within the same grade. This design contrasts with the common technique of tracking a single group of students' behaviors across grades. The prior findings from multiple-group comparisons did not systematically differ from single-group tracking (e.g. Alspaugh & Harting, 1995; Rudolph et al., 2001; Simmons & Blyth, 1987), but many of the variables I studied, such as observed classroom quality or perceived school competence, were never compared between groups in the same grade, giving us only a weak point of comparison in prior research. In other words, despite a conclusive body of evidence that students' functioning declines across their move to middle schools, our understanding of how this functioning would decline in elementary schools is limited. Alspaugh and Harting (1995) decisively argued that students' academic outcomes are on a steady decline across this developmental period; a single group design confounds this developmental trajectory with the effects of school-level transition.

The findings from is study, however, counter many studies comparing students between groups and within grade. Most multi-group studies, such as Alspaugh and Harting (1995) or Simmons and Blyth (1987) found that changing school levels affected students above and beyond the observed developmental trends. That was largely not the case in the present study. Although further analysis is needed, the most plausible explanation of this departure from prior work lies in the quality of middle schools in the sample used. The middle schools in Simmons and Blyth's study were large, and racially and ethnically diverse; students disliked these schools and found them different from their elementary schools the year prior. By contrast, the evidence in this study points to middle schools that parallel elementary schools in many respects. In the

absence of distinct differences between the quality and composition of the two school types, changing school levels may matter little.

Finally, although the lack of difference between elementary and middle schools in this study is encouraging, it warrants further attention. The sample in this study is uniquely broad and geographically diverse. With the exception of studies relying on administrative data (e.g., Cook et al., 2008) studies in this field largely rely on data from a handful schools in one or few school districts (e.g., Midgley et al., 1988; Weiss & Kipnes, 2006). Samples with a narrow geographical spread are vulnerable to regional confounds, which may have shaped some of the results. For example, Weiss and Kipnes (2006) found that the transition groups in their single-school-district sample were correlated with students' race and socioeconomic status; students in K-8 schools were largely well-of White students from more suburban schools, whereas the middle school population was more urban, African-American and poor. It is certainly possible that in such a sample, despite statistical controls, middle schools were different from the K-8 schools in various unobserved ways.

By contrast, the data in this study covers about 600 schools in ten large metropolitan areas across the U.S. To the extent I could measure, the school types (transition groups) were not different from each other, creating a set of equivalent comparison groups. The geographic spread of the sample provides a reassurance that a single district's decision to assign students of certain background to a certain track through middle grades did not bias the sample.

It is also possible that schools changed in the time between the seminal studies in this field and the period of data collection of this study (5^{th} and 6^{th} grade data for SECCYD was collected in about 2002-04). Although many recent studies do find the expected results (e.g., Skinner et al., 2008), some find only limited support for the expected trend of low-quality middle schools (e.g., Jacobs et al., 2002). Perhaps middle schools (or school districts) have embarked on

addressing the criticisms presented by seminal work done 20 years ago and improved their quality of instruction.

Although the lack of difference in quality between the three school types represents a null result, several features of this study provide reassurance that the null findings are not results of a Type II error. Prime among these features is the confidently exogenous nature of assignment into the three transition groups. Unlike prior work recruiting students based on a known path through the middle grades (i.e., deliberately recruiting future middle school and K-8 students; Eccles et al., 1993; Simmons & Blyth, 1987) the participants in the present study were recruited without such consideration. Within the ten selected metropolitan areas, children were recruited at birth in large hospitals representing wide catchment areas (see Allhusen et al., 2001; NICHD E.C.C.R.N., 1994). The child's future likelihood of middle school enrollment was not factored into recruitment and the results in this study indicate that a child's chance of being assigned into any of the three transition groups was unaffected by demographic variables.

Second, the null results are restricted to relations concerning transition group comparisons. The measures of school characteristics and youth functioning showed a rich set of relations weakening an argument of limited power or unreliable measures. The measures in the present study came from multiple informants (participant, teacher, principal, administrative data and independent observations) and these measure showed many of the expected relations, indicating validity of their measurement.

Whatever the reasons for the departures from the prior research, this study presents some compelling conclusions. Most prominently, when students are entering high quality middle schools, their functioning is comparable to their elementary school peers. This finding redirects the policy and research spotlight away from school organization toward school characteristics and quality. Much has been written about the seemingly inherent evil of middle schools, and the need for their elimination (Seidman, Aber, & French, 2004). The findings from this study

challenge this framework and beg for a continued focus on the quality of schools, especially the quality of classroom process.

The clearest finding of the present study was the strong relation between stimulating, warm classrooms taught by efficacious teachers with close relationship to their students and student functioning. Classroom quality is rarely ignored in middle school research and factors prominently into the conceptualization in this arena (Eccles, 2004; Seidman et al., 2004). This study reinforces this focus through findings that test scores, teacher rated achievement, school engagement and perceived self-competence all predicted by classroom process net of school level, student characteristics, and school structure.

Despite the high quality of middle-school classrooms, middle schools are still larger than elementary schools and negatively affecting students' school engagement. This decline could have deleterious effects on students' achievement or even school completion down the line (e.g., Eccles et al., 1993). Unfortunately, the data set used in the present study lacked consistent data after the sixth grade and thus I was unable to explore longer-term effects of changing school levels.

Ideally, future research would extend and update the approach taken by Simmons and Blyth (1987) and Alspaugh and Harting (1995) in which students in different school-transition groups are tracked longitudinally well prior and well after school-level transition. Such an approach would allow for a detailed understanding of any pre-existing differences, developmental trends, or delayed or longer-term effects without eschewing the power of comparing students in the same grade, but multiple settings. Whereas Alspaugh and Harting found some rebounding of grades in the second year post-transition, Simmons and Blyth found persistent effects of school transition as late as ninth grade.

Absent such research, the school-size related decline in school engagement highlights the overall benefits of smaller schools. Eccles et al. (1993) and Simmons and Blyth (1987) argued

for a various mechanisms at play helping students remain involved and interested in school. These assertions seem to remain supported.

Third, this study calls for more detailed evaluation of the effects of school structure and composition. Specifically, the effects of schools' proportion of minority and poor students behaved unexpectedly in the present dataset. Although there is a possibility that diverse student bodies no longer represent fragmented, impersonal school climate with strict rules, this study relied on broader measures than most. Seminal work by Eccles and her colleagues (1993) and by Simmons and Blyth (1987) directly measured schools' departmentalization, fragmentation, strict disciplinary practice, and reduced shared decision-making. No such measures were available in the present study. Given the unexpected relations between school composition and grades and school engagement, a more detailed understanding of school climate and day-to-day operation would be enlightening. Such illumination would need to be provided by future work.

The present study set out to understand school characteristics as mediators of the effect of moving into middle school. Instead, I found a group of middle school student holding their own against their peers in elementary school and enjoying middle schools qualitatively on par with elementary schools. Though unexpected, these results are important in shaping the continued discourse of school reform, and encouraging continued attention to understanding the interplay of school organization and school quality. The majority of students in the U.S. will attend middle school on the way to high school. Although the findings of this study beg for replication and extension, it seems as though passing through middle school is much less traumatic than previously found. The organization of schools' middle grades simply mattered little relative to the quality of the instruction given and the relations between students and teachers.

Appendix

Table A1. Bivariate correlations, means and standard deviations of analysis variables.

		1	2	3	4	5	6	7	8	9	10	11
1	Early t. g.	---										
2	Standard t. g.	---	---									
3	Late t. g.	---	---	---								
4	Obs. Cl 5th	-.04	.03	-.00	---							
5	Teach. R. Cl. 5th	-.00	-.00	.00	.21***	---						
6	Teach. R. Cl. 6th	-.02	-.09**	.10**	.15***	.15***	---					
7	Pct min/poor 5th	-.08*	.10**	-.05	-.22***	-.20***	-.20***	---				
8	Pct min/poor 6th	-.14***	.02	.07+	-.18**	-.23***	-.15***	.87***	---			
9	Sch. size 5th	.20***	-.07*	-.05	.02	-.07*	-.02	.02	-.01	---		
10	Sch. size 6th	-.02	.32***	-.33***	.08*	-.02	-.03	.02	.03	.46***	---	
11	Tea. R. Ach 3rd	.04	-.06+	.04	.13***	.08*	.11**	-.19***	-.14***	.01	-.01	---
12	Tested Ach 3rd	.04	-.01	-.01	.15***	.07*	.13***	-.25***	-.24***	.10**	.06	.71***
13	Tea. R. Ach 5th	.04	-.04	.02	.16***	.21***	.13***	-.19***	-.20***	.02	-.02	.72***
14	Tested Ach 5th	.03	-.02	-.00	.22***	.12***	.12***	-.26***	-.25***	.08*	.07+	.71***
15	Tea. R. Ach. 6th	.05	-.03	.00	.21***	.13***	.24***	-.19***	-.13**	.02	.03	.68***
16	Sch. Att. 5th	-.01	.01	-.01	.10**	.13***	.09*	-.06	-.02	-.08*	.01	.24***
17	Sch. Eng. 6th	-.02	-.09**	.11**	.12***	.14***	.19***	-.22***	-.19***	-.13***	-.13***	.18***
18	Sch. Comp. 6th	.02	.01	-.02	.06+	.13***	.14***	-.06+	-.06	-.01	.04	.34***
19	Female	-.04	.01	.01	.07*	.10**	.10**	-.00	-.03	-.05	-.06	.06+
20	Black	.03	.08*	-.10**	-.17***	-.22***	-.18***	.41***	.37***	-.02	.02	-.30***
21	Hisp	-.04	-.06+	.09**	.05	-.04	.02	.17***	.16***	.10**	.00	-.04
22	Mom Edu	-.01	-.02	.02	.16***	.16***	.17***	-.31***	-.28***	-.03	.03	.39***
23	Inc-to-needs (lg)	-.01	-.04	.04	.27***	.18***	.21***	-.43***	-.36***	-.03	.12**	.43***
	Valid N	961	961	961	891	874	841	923	629	928	630	880
	Mean	.10	.49	.41	.00	-.00	-.00	-.00	.00	.49	.69	-.00
	SD	.31	.50	.49	.88	.73	.75	.93	.93	.22	.30	.90

Continued on next page

Table A1 continued.

		12	13	14	15	16	17	18	19	20	21	22	23
1	Early t. g.												
2	Standard t.g												
3	Late t.g.												
4	Obs. Cl 5th												
5	Teach. R. Cl. 5th												
6	Teach. R. Cl. 6th												
7	Pct min/poor 5th												
8	Pct min/poor 6th												
9	Sch. size 5th												
10	Sch. size 6th												
11	Tea. R. Ach 3rd												
12	Tested Ach 3rd	---											
13	Tea. R. Ach 5th	.68***	---										
14	Tested Ach 5th	.88***	.69***	---									
15	Tea. R. Ach. 6th	.64***	.74***	.66***	---								
16	Sch. Att. 5th	.20***	.31***	.23***	.33***	---							
17	Sch. Eng. 6th	.12***	.20***	.13***	.23***	.42***	---						
18	Sch. Comp. 6th	.28***	.38***	.32***	.41***	.43***	.47***	---					
19	Female.	.04	.14***	.04	.14***	.28***	.24***	.13***	---				
20	Black.	-.33***	-.33***	-.34***	-.29***	-.01	-.14***	-.05	-.00	---			
21	Hisp.	-.05	-.05	-.05	-.03	.02	-.07*	-.00	-.03	-.06	---		
22	Mom Edu.	.38***	.41***	.43***	.39***	.12***	.20***	.25***	.04	-.22***	-.11***	---	
23	Inc-to-needs (lg)	.43***	.43***	.46***	.43***	.14***	.27***	.24***	.03	-.37***	-.09**	.63***	
	Valid N	900	871	899	838	923	922	925	961	961	961	961	961
	Mean	-.00	.00	.00	-.00	.00	.00	.00	.51	.11	.06	14.39	1.09
	SD	.92	.90	.91	.91	.83	.70	.72	.50	.32	.24	2.46	.74

Table A2. Mediational model in fifth grade

	No covariates		With covariates	
	Std. coeff (S.E.)	R^2	Std. coeff (S.E.)	R^2
Reference: late transition[a]				
Observed classrm. qual.[cd]		0.00		0.25
Early transition[b]	-0.04 (0.04)		-0.01 (0.03)	
Standard transition[a]	0.01 (0.04)		0.05 (0.04)	
Teacher-reported classrm. qual.[cd]		0.00		0.09
Early transition[b]	-0.06 (0.05)		0.01 (0.04)	
Standard transition[a]	-0.00 (0.04)		0.03 (0.04)	
School pct minority and poor[c]		0.01		0.34
Early transition[b]	-0.06 (0.05)		-0.02 (0.03)	
Standard transition[a]	0.08 (0.04)$^{+}$		0.08 (0.04)*	
School size[c]		0.04		0.17
Early transition[b]	0.20 (0.05)***		0.24 (0.05)***	
Standard transition[a]	-0.00 (0.04)		0.03 (0.04)	
Tested achievement[cde]		0.09		0.68
Early transition[b]	0.00 (0.03)		0.01 (0.02)	
Standard transition[a]	0.00 (0.03)		0.04 (0.02)$^{+}$	
Observed classroom quality	0.16 (0.03)***		0.08 (0.02)***	
Teacher-rated classroom quality	0.04 (0.03)		0.00 (0.02)	
School percent minority and poor	-0.23 (0.04)***		-0.03 (0.03)	
School size	0.09 (0.03)**		0.05 (0.02)*	
Teacher-rated achievement[cde]		0.06		0.62
Early transition[b]	0.02 (0.03)		0.03 (0.02)	
Standard transition[a]	-0.02 (0.03)		0.02 (0.02)	
Observed classroom quality	0.08 (0.03)*		0.00 (0.03)	
Teacher-rated classroom quality	0.17 (0.03)***		0.11 (0.02)***	
School percent minority and poor	-0.15 (0.04)***		0.07 (0.03)*	
School size	0.03 (0.03)		-0.00 (0.02)	
School attachment[cde]		0.02		0.17
Early transition[b]	0.01 (0.04)		0.00 (0.04)	
Standard transition[a]	-0.01 (0.03)		0.03 (0.03)	
Observed classroom quality	0.08 (0.03)*		0.05 (0.04)	
Teacher-rated classroom quality	0.11 (0.03)***		0.09 (0.03)**	
School percent minority and poor	-0.02 (0.04)		-0.00 (0.04)	
School size	-0.07 (0.04)$^{+}$		-0.06 (0.04)	

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Table A2 continued.

	No covariates		With covariates	
	Std. coeff (S.E.)	R^2	Std. coeff (S.E.)	R^2
Reference: standard transition[a]				
Observed classrm qual.[cd]		0.00		0.25
Early transition[b]	-0.05 (0.04)		-0.04 (0.03)	
Teacher-rated classrm qual[cd]		0.00		0.09
Early transition[b]	-0.01 (0.05)		-0.01 (0.04)	
School pct minority and poor[c]		0.01		0.34
Early transition[b]	-0.10 (0.05)*		-0.06 (0.03)*	
School size[c]		0.04		0.17
Early transition[b]	0.20 (0.05)***		0.22 (0.05)***	
Tested achievement[cde]		0.09		0.68
Early transition[b]	0.00 (0.03)		-0.01 (0.02)	
Observed classrm qual.	0.16 (0.03)***		0.08 (0.02)***	
Teacher-rated classrm qual.	0.04 (0.03)		0.00 (0.02)	
School pct minority and poor	-0.23 (0.04)***		-0.03 (0.03)	
School size	0.09 (0.03)**		0.05 (0.02)*	
Teacher-rated achievement[cde]		0.06		0.62
Early transition[b]	0.03 (0.03)		0.02 (0.02)	
Observed classrm qual	0.02 (0.03)		0.00 (0.03)	
Teacher-rated classrm qual	0.08 (0.03)*		0.11 (0.02)***	
School pct minority and poor	0.17 (0.03)***		0.07 (0.03)*	
School size	0.03 (0.03)		-0.00 (0.02)	
School attachment[cde]		0.02		0.17
Early transition[b]	0.00 (0.04)		-0.02 (0.03)	
Observed classrm qual.	0.08 (0.03)*		0.05 (0.04)	
Teacher-rated classrm qual.	0.11 (0.03)***		0.09 (0.03)**	
School pct minority and poor	-0.02 (0.04)		-0.00 (0.04)	
School size	-0.07 (0.04)$^{+}$		-0.06 (0.04)	
Model fit				
Chi^2 / df	15.83		3.46	
CFI	0.88		0.99	
TLI	0.32		0.86	
RMSEA	0.12		0.05	
AIC	14,441.28		24,322.92	

Note. [a] In elementary school; [b] In middle school: [c] Covariates are: child race, mother's education, family income to needs (log), and data collection site; [d] Added covariate: child gender; [e] Added covariate: achievement in third grade; $^{+}$ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$; $N = 869$

Table A3. Mediational model in sixth grade

	No covariates		With covariates	
	Std. coeff (S.E.)	R^2	Std. coeff (S.E.)	R^2
Reference: late transition[a]				
Teacher-rated classrm qual[cd]		0.01		0.10
Early transition[b]	-0.04 (0.04)		0.00 (0.04)	
Standard transition[b]	-0.08 (0.04)*		-0.05 (0.04)	
School pct minority and poor[c]		0.02		0.33
Early transition[b]	-0.16 (0.06)**		-0.08 (0.05)$^{+}$	
Standard transition[b]	-0.04 (0.05)		-0.03 (0.05)	
School size[c]		0.13		0.29
Early transition[b]	0.14 (0.05)**		0.16 (0.05)**	
Standard transition[b]	0.39 (0.04)***		0.42 (0.05)***	
Teacher-rated achievement[cde]		0.06		0.56
Early transition[b]	0.06 (0.04)		0.06 (0.03)$^{+}$	
Standard transition[b]	0.02 (0.04)		0.03 (0.03)	
Teacher-rated classrm qual	0.22 (0.04)***		0.12 (0.03)***	
School pct minority and poor	-0.10 (0.05)*		0.09 (0.04)*	
School size	0.03 (0.04)		0.02 (0.04)	
School involvement[cde]		0.08		0.18
Early transition[b]	-0.04 (0.04)		-0.03 (0.04)	
Standard transition[b]	-0.02 (0.04)		-0.03 (0.05)	
Teacher-rated classrm qual	0.18 (0.04)***		0.13 (0.04)***	
School pct minority and poor	-0.17 (0.04)***		-0.09 (0.05)*	
School size	-0.12 (0.04)**		-0.14 (0.03)***	
Perceived school competence[cde]		0.03		0.19
Early transition[b]	0.02 (0.04)		0.02 (0.03)	
Standard transition[b]	0.02 (0.04)		0.02 (0.04)	
Teacher-rated classrm qual	0.14 (0.04)**		0.09 (0.04)*	
School pct minority and poor	-0.04 (0.05)		0.04 (0.05)	
School size	0.06 (0.04)		0.04 (0.04)	

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Table A3 continued.

	No covariates Std. coeff (S.E.)	R^2	With covariates Std. coefft (S.E.)	R^2
Reference: standard transition[bf]				
Teacher-rated classrm qual[cd]		0.01		0.10
Early transition[b]	0.02 (0.04)		0.03 (0.05)	
School pct minority and poor[c]		0.02		0.33
Early transition[b]	-0.13 (0.05)*		-0.06 (0.04)	
School size[c]		0.13		0.29
Early transition[b]	-0.11 (0.05)*		-0.10 (0.05)*	
Teacher-rated achievement[cde]		0.06		0.56
Early transition[b]	0.04 (0.04)		0.04 (0.03)	
Teacher-rated classrm qual	0.22 (0.04)***		0.12 (0.03)***	
School pct minority and poor	-0.10 (0.05)*		0.09 (0.04)*	
School size	0.03 (0.04)		0.02 (0.04)	
School involvement[cde]		0.08		0.18
Early transition[b]	-0.03 (0.03)		-0.01 (0.03)	
Teacher-rated classrm qual	0.02 (0.04)		0.13 (0.04)***	
School pct minority and poor	0.18 (0.04)***		-0.09 (0.05)*	
School size	-0.12 (0.04)**		-0.14 (0.05)**	
Perceive school competence[cde]		0.03		0.19
Early transition[b]	0.01 (0.04)		0.01 (0.03)	
Teacher-rated classrm qual	0.14 (0.04)**		0.09 (0.04)*	
School pct minority and poor	-0.04 (0.05)		0.04 (0.05)	
School size	0.06 (0.04)		0.04 (0.04)	
Model fit				
Chi^2 / df	3.62		0.68	
CFI	0.98		1.00	
TLI	0.84		1.00	
RMSEA	0.06		0.00	
AIC	10,387.85		20,055.54	

N = 869

Note. [a] In elementary school; [b] In middle school: [c] Covariates are: child race, mother's education, family income to needs (log), and data collection site; [d] Additional covariate: child gender; [e] Additional covariate: achievement in third grade; [+] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$;

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